Full wwPDB X-ray Structure Validation Report (i)

Nov 6, 2023 – 02:29 PM JST

PDB ID	:	7X6F
Title	:	Outer membrane lipoprotein QseG of Escherichia coli O157:H7
Authors	:	Matsumoto, K.; Fukuda, Y.; Inoue, T.
Deposited on	:	2022-03-07
Resolution	:	2.30 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references (1)) were used in the production of this report:

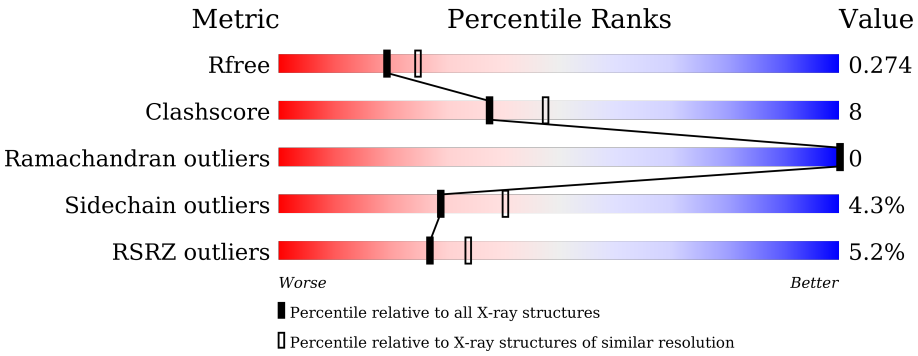
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.13
EDS	:	2.36
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	5042 (2.30-2.30)
Clashscore	141614	5643 (2.30-2.30)
Ramachandran outliers	138981	5575 (2.30-2.30)
Sidechain outliers	138945	5575 (2.30-2.30)
RSRZ outliers	127900	4938 (2.30-2.30)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	175	4% 66% 15% • 18%
1	B	175	% 71% 14% • 14%
1	C	175	3% 65% 18% 18%
1	D	175	2% 75% 11% 14%
1	E	175	2% 64% 19% • 15%
1	F	175	15% 65% 16% • 17%

2 Entry composition (i)

There are 7 unique types of molecules in this entry. The entry contains 7708 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Quorum-sensing regulator protein G.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	144	Total	C	N	O	S	0	3	0
			1211	749	226	231	5			
1	B	150	Total	C	N	O	S	0	0	0
			1239	767	230	238	4			
1	C	144	Total	C	N	O	S	0	1	0
			1194	740	221	228	5			
1	D	151	Total	C	N	O	S	0	2	0
			1265	782	237	242	4			
1	E	149	Total	C	N	O	S	0	2	0
			1251	772	235	240	4			
1	F	145	Total	C	N	O	S	0	1	0
			1208	750	223	231	4			

There are 126 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	35	MET	-	initiating methionine	UNP P0AD45
A	36	GLY	-	expression tag	UNP P0AD45
A	37	SER	-	expression tag	UNP P0AD45
A	38	SER	-	expression tag	UNP P0AD45
A	39	HIS	-	expression tag	UNP P0AD45
A	40	HIS	-	expression tag	UNP P0AD45
A	41	HIS	-	expression tag	UNP P0AD45
A	42	HIS	-	expression tag	UNP P0AD45
A	43	HIS	-	expression tag	UNP P0AD45
A	44	HIS	-	expression tag	UNP P0AD45
A	45	GLY	-	expression tag	UNP P0AD45
A	46	GLY	-	expression tag	UNP P0AD45
A	47	GLY	-	expression tag	UNP P0AD45
A	48	SER	-	expression tag	UNP P0AD45
A	49	GLU	-	expression tag	UNP P0AD45
A	50	ASN	-	expression tag	UNP P0AD45
A	51	LEU	-	expression tag	UNP P0AD45

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Chain	Residue	Modelled	Actual	Comment	Reference
A	52	TYR	-	expression tag	UNP P0AD45
A	53	PHE	-	expression tag	UNP P0AD45
A	54	GLN	-	expression tag	UNP P0AD45
A	55	GLY	-	expression tag	UNP P0AD45
B	35	MET	-	initiating methionine	UNP P0AD45
B	36	GLY	-	expression tag	UNP P0AD45
B	37	SER	-	expression tag	UNP P0AD45
B	38	SER	-	expression tag	UNP P0AD45
B	39	HIS	-	expression tag	UNP P0AD45
B	40	HIS	-	expression tag	UNP P0AD45
B	41	HIS	-	expression tag	UNP P0AD45
B	42	HIS	-	expression tag	UNP P0AD45
B	43	HIS	-	expression tag	UNP P0AD45
B	44	HIS	-	expression tag	UNP P0AD45
B	45	GLY	-	expression tag	UNP P0AD45
B	46	GLY	-	expression tag	UNP P0AD45
B	47	GLY	-	expression tag	UNP P0AD45
B	48	SER	-	expression tag	UNP P0AD45
B	49	GLU	-	expression tag	UNP P0AD45
B	50	ASN	-	expression tag	UNP P0AD45
B	51	LEU	-	expression tag	UNP P0AD45
B	52	TYR	-	expression tag	UNP P0AD45
B	53	PHE	-	expression tag	UNP P0AD45
B	54	GLN	-	expression tag	UNP P0AD45
B	55	GLY	-	expression tag	UNP P0AD45
C	35	MET	-	initiating methionine	UNP P0AD45
C	36	GLY	-	expression tag	UNP P0AD45
C	37	SER	-	expression tag	UNP P0AD45
C	38	SER	-	expression tag	UNP P0AD45
C	39	HIS	-	expression tag	UNP P0AD45
C	40	HIS	-	expression tag	UNP P0AD45
C	41	HIS	-	expression tag	UNP P0AD45
C	42	HIS	-	expression tag	UNP P0AD45
C	43	HIS	-	expression tag	UNP P0AD45
C	44	HIS	-	expression tag	UNP P0AD45
C	45	GLY	-	expression tag	UNP P0AD45
C	46	GLY	-	expression tag	UNP P0AD45
C	47	GLY	-	expression tag	UNP P0AD45
C	48	SER	-	expression tag	UNP P0AD45
C	49	GLU	-	expression tag	UNP P0AD45
C	50	ASN	-	expression tag	UNP P0AD45
C	51	LEU	-	expression tag	UNP P0AD45

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Chain	Residue	Modelled	Actual	Comment	Reference
C	52	TYR	-	expression tag	UNP P0AD45
C	53	PHE	-	expression tag	UNP P0AD45
C	54	GLN	-	expression tag	UNP P0AD45
C	55	GLY	-	expression tag	UNP P0AD45
D	35	MET	-	initiating methionine	UNP P0AD45
D	36	GLY	-	expression tag	UNP P0AD45
D	37	SER	-	expression tag	UNP P0AD45
D	38	SER	-	expression tag	UNP P0AD45
D	39	HIS	-	expression tag	UNP P0AD45
D	40	HIS	-	expression tag	UNP P0AD45
D	41	HIS	-	expression tag	UNP P0AD45
D	42	HIS	-	expression tag	UNP P0AD45
D	43	HIS	-	expression tag	UNP P0AD45
D	44	HIS	-	expression tag	UNP P0AD45
D	45	GLY	-	expression tag	UNP P0AD45
D	46	GLY	-	expression tag	UNP P0AD45
D	47	GLY	-	expression tag	UNP P0AD45
D	48	SER	-	expression tag	UNP P0AD45
D	49	GLU	-	expression tag	UNP P0AD45
D	50	ASN	-	expression tag	UNP P0AD45
D	51	LEU	-	expression tag	UNP P0AD45
D	52	TYR	-	expression tag	UNP P0AD45
D	53	PHE	-	expression tag	UNP P0AD45
D	54	GLN	-	expression tag	UNP P0AD45
D	55	GLY	-	expression tag	UNP P0AD45
E	35	MET	-	initiating methionine	UNP P0AD45
E	36	GLY	-	expression tag	UNP P0AD45
E	37	SER	-	expression tag	UNP P0AD45
E	38	SER	-	expression tag	UNP P0AD45
E	39	HIS	-	expression tag	UNP P0AD45
E	40	HIS	-	expression tag	UNP P0AD45
E	41	HIS	-	expression tag	UNP P0AD45
E	42	HIS	-	expression tag	UNP P0AD45
E	43	HIS	-	expression tag	UNP P0AD45
E	44	HIS	-	expression tag	UNP P0AD45
E	45	GLY	-	expression tag	UNP P0AD45
E	46	GLY	-	expression tag	UNP P0AD45
E	47	GLY	-	expression tag	UNP P0AD45
E	48	SER	-	expression tag	UNP P0AD45
E	49	GLU	-	expression tag	UNP P0AD45
E	50	ASN	-	expression tag	UNP P0AD45
E	51	LEU	-	expression tag	UNP P0AD45

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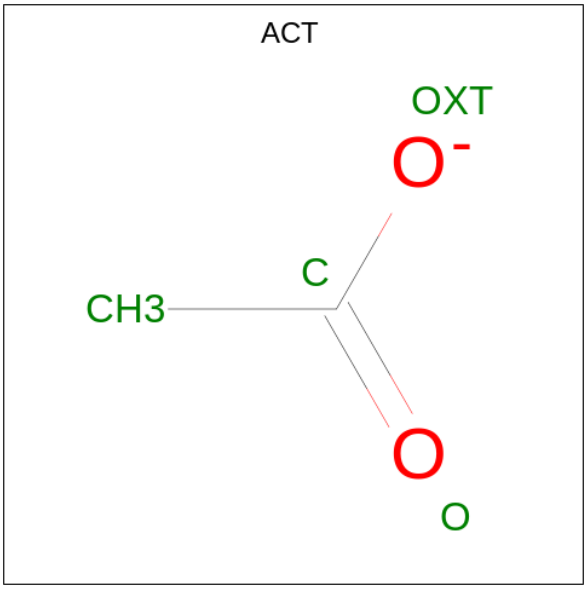
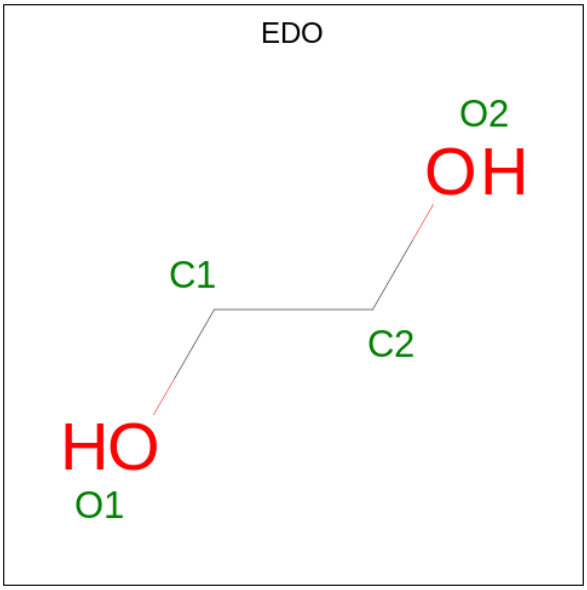
Chain	Residue	Modelled	Actual	Comment	Reference
E	52	TYR	-	expression tag	UNP P0AD45
E	53	PHE	-	expression tag	UNP P0AD45
E	54	GLN	-	expression tag	UNP P0AD45
E	55	GLY	-	expression tag	UNP P0AD45
F	35	MET	-	initiating methionine	UNP P0AD45
F	36	GLY	-	expression tag	UNP P0AD45
F	37	SER	-	expression tag	UNP P0AD45
F	38	SER	-	expression tag	UNP P0AD45
F	39	HIS	-	expression tag	UNP P0AD45
F	40	HIS	-	expression tag	UNP P0AD45
F	41	HIS	-	expression tag	UNP P0AD45
F	42	HIS	-	expression tag	UNP P0AD45
F	43	HIS	-	expression tag	UNP P0AD45
F	44	HIS	-	expression tag	UNP P0AD45
F	45	GLY	-	expression tag	UNP P0AD45
F	46	GLY	-	expression tag	UNP P0AD45
F	47	GLY	-	expression tag	UNP P0AD45
F	48	SER	-	expression tag	UNP P0AD45
F	49	GLU	-	expression tag	UNP P0AD45
F	50	ASN	-	expression tag	UNP P0AD45
F	51	LEU	-	expression tag	UNP P0AD45
F	52	TYR	-	expression tag	UNP P0AD45
F	53	PHE	-	expression tag	UNP P0AD45
F	54	GLN	-	expression tag	UNP P0AD45
F	55	GLY	-	expression tag	UNP P0AD45

- Molecule 2 is ACETATE ION (three-letter code: ACT) (formula: $C_2H_3O_2$).



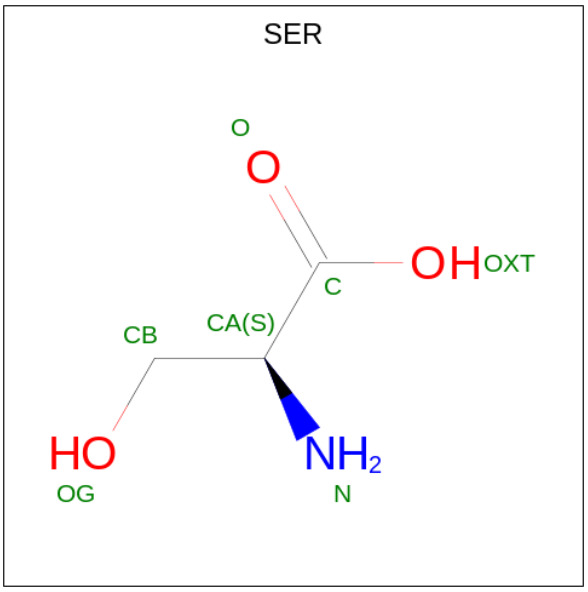
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	C	O	0	0
			4	2	2		
2	B	1	Total	C	O	0	0
			4	2	2		
2	C	1	Total	C	O	0	0
			4	2	2		
2	D	1	Total	C	O	0	0
			4	2	2		

- Molecule 3 is 1,2-ETHANEDIOL (three-letter code: EDO) (formula: $C_2H_6O_2$).



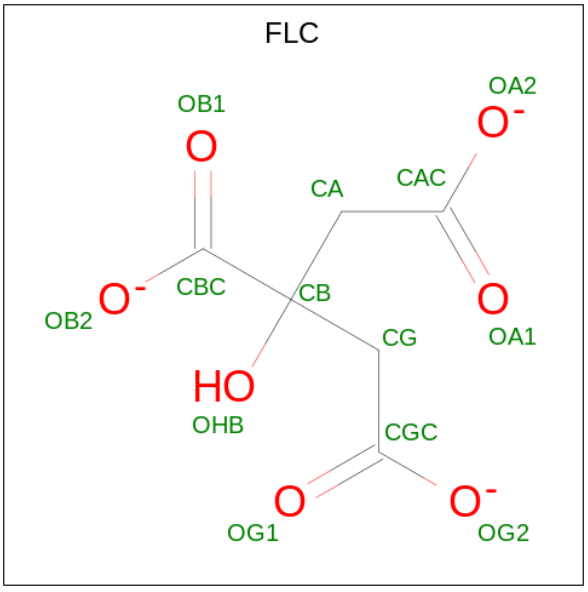
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			4	2	2		
3	C	1	Total	C	O	0	1
			8	4	4		

- Molecule 4 is SERINE (three-letter code: SER) (formula: $C_3H_7NO_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total C N O 6 3 1 2	0	0

- Molecule 5 is CITRATE ANION (three-letter code: FLC) (formula: $C_6H_5O_7$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total C O 13 6 7	0	0
5	D	1	Total C O 13 6 7	0	0

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	1	Total Mg 1 1	0	0

- Molecule 7 is water.

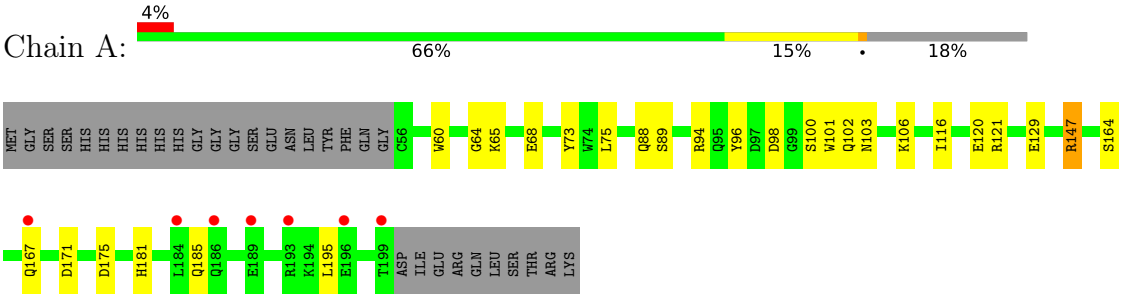
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	A	52	Total O 52 52	0	0
7	B	60	Total O 60 60	0	0
7	C	59	Total O 59 59	0	3
7	D	46	Total O 46 46	0	1
7	E	35	Total O 35 35	0	0
7	F	27	Total O 27 27	0	0

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

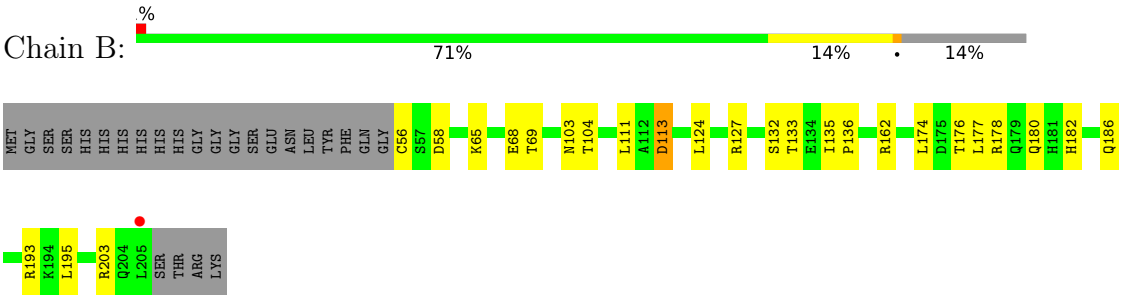
• Molecule 1: Quorum-sensing regulator protein G

Chain A:



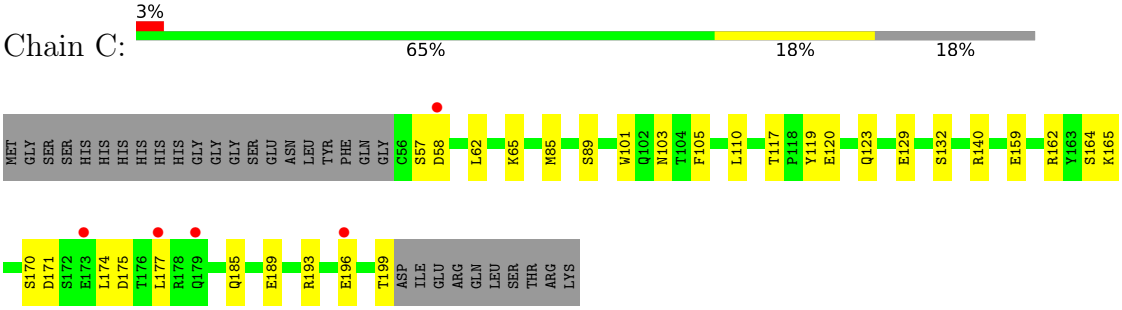
• Molecule 1: Quorum-sensing regulator protein G

Chain B:



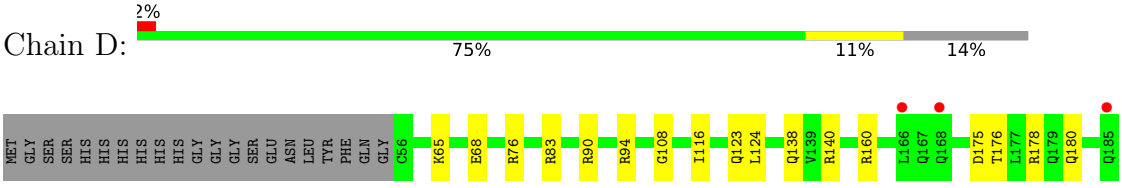
• Molecule 1: Quorum-sensing regulator protein G

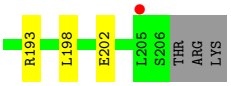
Chain C:



• Molecule 1: Quorum-sensing regulator protein G

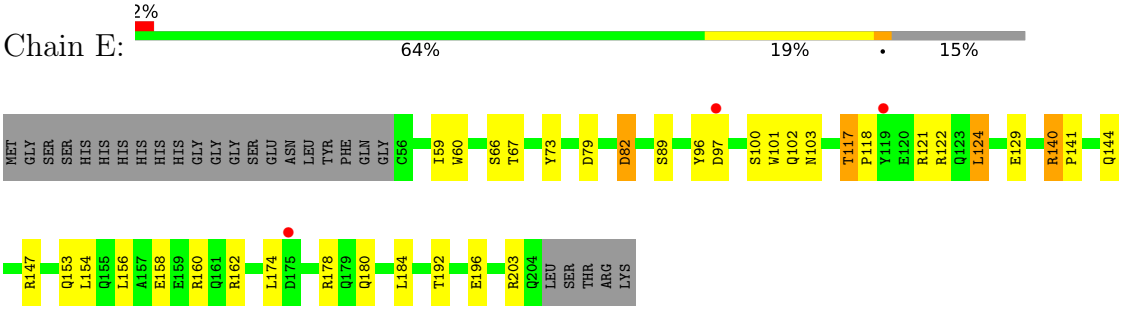
Chain D:





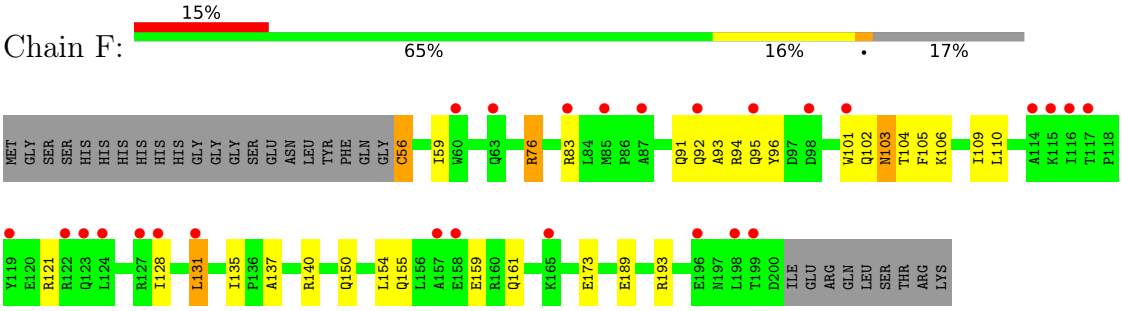
• Molecule 1: Quorum-sensing regulator protein G

Chain E:



• Molecule 1: Quorum-sensing regulator protein G

Chain F:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	42.96Å 149.78Å 88.30Å 90.00° 94.65° 90.00°	Depositor
Resolution (Å)	39.80 – 2.30 39.80 – 2.30	Depositor EDS
% Data completeness (in resolution range)	98.8 (39.80-2.30) 98.9 (39.80-2.30)	Depositor EDS
R_{merge}	0.09	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.46 (at 2.29Å)	Xtriage
Refinement program	REFMAC 5.8.0267, PHENIX 1.19.2	Depositor
R, R_{free}	0.221 , 0.274 0.221 , 0.274	Depositor DCC
R_{free} test set	2466 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	42.8	Xtriage
Anisotropy	0.054	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.30 , 53.3	EDS
L-test for twinning[2]	$< \|L\| > = 0.50$, $< L^2 > = 0.33$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.93	EDS
Total number of atoms	7708	wwPDB-VP
Average B, all atoms (Å^2)	52.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.77% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: FLC, MG, EDO, ACT

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.44	0/1231	0.66	0/1665
1	B	0.41	0/1259	0.60	0/1703
1	C	0.45	0/1214	0.67	0/1643
1	D	0.42	0/1285	0.62	0/1736
1	E	0.37	0/1271	0.62	1/1718 (0.1%)
1	F	0.33	0/1230	0.60	0/1666
All	All	0.40	0/7490	0.63	1/10131 (0.0%)

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	124	LEU	CA-CB-CG	5.00	126.80	115.30

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1211	0	1196	17	0
1	B	1239	0	1224	19	0
1	C	1194	0	1180	20	0
1	D	1265	0	1253	15	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	E	1251	0	1232	22	0
1	F	1208	0	1184	27	0
2	A	4	0	3	0	0
2	B	4	0	3	1	0
2	C	4	0	3	0	0
2	D	4	0	3	0	0
3	A	4	0	6	1	0
3	C	8	0	12	2	0
4	B	6	0	4	1	0
5	C	13	0	5	2	0
5	D	13	0	5	2	0
6	C	1	0	0	0	0
7	A	52	0	0	3	0
7	B	60	0	0	7	0
7	C	59	0	0	5	0
7	D	46	0	0	4	0
7	E	35	0	0	2	0
7	F	27	0	0	0	0
All	All	7708	0	7313	114	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

All (114) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:196:GLU:HA	1:C:199:THR:HG22	1.59	0.84
1:A:101:TRP:HE1	3:A:302:EDO:H22	1.43	0.83
1:F:91:GLN:O	1:F:95:GLN:NE2	2.15	0.80
1:B:56:CYS:N	7:B:403:HOH:O	2.17	0.78
1:C:65:LYS:H	5:C:303:FLC:HA2	1.48	0.78
1:E:117:THR:HG22	1:E:118:PRO:HD2	1.69	0.74
1:F:101[A]:TRP:HA	1:F:131:LEU:HD13	1.71	0.72
1:F:101[B]:TRP:HA	1:F:131:LEU:HD13	1.70	0.72
1:F:96:TYR:HB3	1:F:103:ASN:HB3	1.72	0.71
1:A:65:LYS:H	1:A:65:LYS:HD3	1.56	0.70
1:D:140:ARG:NE	7:D:402:HOH:O	2.23	0.70
1:D:83:ARG:NH2	7:D:403:HOH:O	2.24	0.70
1:F:137:ALA:HA	1:F:140:ARG:HD2	1.74	0.69
1:E:178:ARG:NH2	1:F:173:GLU:OE2	2.26	0.69
1:A:68:GLU:OE2	1:A:102:GLN:NE2	2.23	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:123:GLN:OE1	7:D:401:HOH:O	2.10	0.69
1:B:162:ARG:NH2	7:B:404:HOH:O	2.26	0.68
1:B:203:ARG:O	4:B:301:SER:N	2.27	0.67
1:B:68:GLU:OE1	7:B:402:HOH:O	2.14	0.65
1:C:177:LEU:HD21	1:D:178:ARG:HG2	1.78	0.64
1:C:159:GLU:OE2	7:C:401:HOH:O	2.15	0.63
1:B:103:ASN:ND2	7:B:405:HOH:O	2.32	0.61
1:E:154:LEU:O	1:E:158:GLU:HG3	2.00	0.61
1:A:98:ASP:CG	1:A:103:ASN:HD22	2.04	0.61
1:F:56:CYS:HA	1:F:76:ARG:HH12	1.67	0.60
1:C:140:ARG:NH2	7:C:402:HOH:O	2.21	0.60
1:E:122:ARG:HA	1:E:154:LEU:HD11	1.84	0.60
1:C:132:SER:O	1:C:140:ARG:NH1	2.34	0.59
1:F:189:GLU:O	1:F:193:ARG:HG3	2.02	0.59
1:A:129:GLU:OE1	1:A:147:ARG:NH1	2.37	0.57
1:B:65:LYS:HA	1:B:68:GLU:HG2	1.86	0.57
1:E:82:ASP:OD2	7:E:301:HOH:O	2.17	0.57
1:C:185:GLN:O	1:C:189:GLU:HG2	2.05	0.57
1:D:176:THR:O	1:D:180:GLN:HG3	2.05	0.57
1:C:119:TYR:HB3	7:C:407:HOH:O	2.04	0.56
1:A:94:ARG:O	7:A:401:HOH:O	2.17	0.56
1:B:127:ARG:NH2	7:B:401:HOH:O	2.11	0.56
1:B:174:LEU:HD23	1:B:178:ARG:HH22	1.71	0.56
1:F:92:GLN:HA	1:F:95:GLN:HE21	1.70	0.56
1:F:121:ARG:NH1	1:F:150:GLN:OE1	2.39	0.56
1:B:132:SER:HA	1:B:135:ILE:HD12	1.87	0.55
1:C:162:ARG:HA	1:C:165:LYS:HE3	1.88	0.55
1:F:105:PHE:O	1:F:109:ILE:HG13	2.07	0.55
1:E:122:ARG:HB2	1:E:154:LEU:HD21	1.88	0.54
1:C:189:GLU:O	1:C:193:ARG:HG3	2.08	0.54
1:D:198:LEU:O	1:D:202:GLU:HG2	2.08	0.54
1:A:181:HIS:O	1:A:185:GLN:HB2	2.09	0.53
1:D:65[B]:LYS:N	5:D:302:FLC:OB1	2.42	0.53
1:B:133:THR:HG22	2:B:302:ACT:H1	1.90	0.53
1:F:102:GLN:O	1:F:106:LYS:HG3	2.09	0.53
1:D:65[B]:LYS:HA	1:D:68:GLU:HG2	1.92	0.51
1:F:56:CYS:HA	1:F:76:ARG:NH1	2.25	0.51
1:F:155:GLN:O	1:F:159:GLU:HG2	2.10	0.51
1:B:193:ARG:HD2	7:B:410:HOH:O	2.09	0.51
1:E:192:THR:O	1:E:196:GLU:HG2	2.10	0.51
1:D:65[A]:LYS:N	5:D:302:FLC:OB1	2.42	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:60:TRP:HB3	1:E:96:TYR:OH	2.10	0.51
1:F:104:THR:HG22	1:F:128:ILE:HD13	1.93	0.50
1:C:58:ASP:O	1:C:62:LEU:HG	2.11	0.50
1:E:100:SER:OG	1:E:103:ASN:OD1	2.29	0.50
1:C:89:SER:OG	1:C:110:LEU:O	2.30	0.49
1:F:101[A]:TRP:CA	1:F:131:LEU:HD13	2.40	0.49
1:B:104:THR:HG21	1:B:127:ARG:HB3	1.93	0.49
1:C:123:GLN:NE2	7:C:407:HOH:O	2.45	0.49
1:B:111:LEU:HD12	1:B:124:LEU:HD21	1.95	0.48
1:E:101:TRP:CE2	1:E:102:GLN:HG3	2.48	0.48
1:A:88:GLN:NE2	7:A:412:HOH:O	2.47	0.48
1:D:90:ARG:HH12	1:D:116:ILE:HG22	1.79	0.48
1:A:121[B]:ARG:NH2	7:A:404:HOH:O	2.31	0.48
1:F:103:ASN:HD22	1:F:103:ASN:N	2.12	0.48
1:F:135:ILE:H	1:F:140:ARG:NH2	2.12	0.47
1:F:135:ILE:O	1:F:140:ARG:NE	2.38	0.47
1:F:93:ALA:HA	1:F:110:LEU:HD13	1.96	0.47
1:A:167:GLN:O	1:A:171:ASP:HB2	2.15	0.47
1:C:101:TRP:HE1	3:C:302[B]:EDO:H21	1.79	0.47
1:E:180:GLN:O	1:E:184:LEU:HG	2.14	0.47
1:D:65[A]:LYS:HA	1:D:68:GLU:HG2	1.96	0.47
1:A:64:GLY:O	1:A:68:GLU:HG3	2.17	0.45
1:D:175:ASP:OD1	1:D:178:ARG:NH1	2.50	0.44
1:A:195:LEU:HD21	1:B:195:LEU:HA	2.00	0.44
1:E:79:ASP:OD1	7:E:302:HOH:O	2.21	0.44
1:E:156:LEU:HD23	1:E:156:LEU:HA	1.88	0.44
1:E:156:LEU:O	1:E:160:ARG:HG3	2.18	0.43
1:F:83:ARG:HG2	1:F:83:ARG:HH11	1.83	0.43
1:F:83:ARG:HG2	1:F:83:ARG:NH1	2.33	0.43
1:B:69:THR:HA	1:B:136:PRO:HG2	2.00	0.43
1:C:101:TRP:HE1	3:C:302[A]:EDO:H22	1.82	0.43
1:B:182:HIS:O	1:B:186:GLN:HG3	2.19	0.43
1:B:174:LEU:HD23	1:B:178:ARG:NH2	2.34	0.43
1:A:60:TRP:HB3	1:A:96:TYR:OH	2.19	0.43
1:E:140:ARG:HB3	1:E:141:PRO:HD3	2.01	0.43
1:B:176:THR:O	1:B:180:GLN:HG3	2.20	0.42
1:B:113:ASP:HB2	7:B:443:HOH:O	2.18	0.42
1:C:65:LYS:N	5:C:303:FLC:HA2	2.25	0.42
1:D:108:GLY:HA2	1:D:124:LEU:HD13	2.02	0.42
1:A:75:LEU:HD23	1:A:75:LEU:HA	1.93	0.42
1:E:129:GLU:CD	1:E:147:ARG:HD2	2.41	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:165:LYS:HE2	1:C:165:LYS:HB2	1.77	0.41
1:E:174:LEU:HD22	1:F:173:GLU:HG2	2.02	0.41
1:A:73:TYR:OH	1:A:106:LYS:HE2	2.19	0.41
1:C:103:ASN:ND2	7:C:409:HOH:O	2.54	0.41
1:E:59:ILE:HG13	1:E:73:TYR:CE1	2.56	0.41
1:C:117:THR:OG1	1:C:120:GLU:HG3	2.20	0.41
1:C:170:SER:O	1:C:174:LEU:HG	2.20	0.41
1:D:94:ARG:HH21	1:E:153:GLN:HE21	1.69	0.41
1:D:160:ARG:NH1	7:D:405:HOH:O	2.38	0.41
1:E:174:LEU:CD2	1:F:173:GLU:HG2	2.51	0.41
1:F:96:TYR:HD1	1:F:103:ASN:OD1	2.03	0.41
1:A:116:ILE:HB	1:A:120:GLU:HB2	2.02	0.41
1:F:59:ILE:HD13	1:F:76:ARG:NH1	2.36	0.40
1:F:59:ILE:HG12	1:F:76:ARG:HD2	2.03	0.40
1:E:121:ARG:O	1:E:124:LEU:HG	2.21	0.40
1:A:100[B]:SER:OG	1:A:102:GLN:OE1	2.36	0.40
1:E:100:SER:HB2	1:E:102:GLN:OE1	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	145/175 (83%)	142 (98%)	3 (2%)	0	100	100
1	B	148/175 (85%)	146 (99%)	2 (1%)	0	100	100
1	C	143/175 (82%)	140 (98%)	3 (2%)	0	100	100
1	D	151/175 (86%)	146 (97%)	5 (3%)	0	100	100
1	E	149/175 (85%)	146 (98%)	3 (2%)	0	100	100
1	F	144/175 (82%)	136 (94%)	8 (6%)	0	100	100
All	All	880/1050 (84%)	856 (97%)	24 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	131/154 (85%)	127 (97%)	4 (3%)	40	55
1	B	134/154 (87%)	131 (98%)	3 (2%)	52	69
1	C	129/154 (84%)	121 (94%)	8 (6%)	18	25
1	D	137/154 (89%)	134 (98%)	3 (2%)	52	69
1	E	135/154 (88%)	124 (92%)	11 (8%)	11	15
1	F	130/154 (84%)	123 (95%)	7 (5%)	22	30
All	All	796/924 (86%)	760 (96%)	36 (4%)	29	39

All (36) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	89	SER
1	A	147	ARG
1	A	164	SER
1	A	175	ASP
1	B	58	ASP
1	B	113	ASP
1	B	177	LEU
1	C	57	SER
1	C	85[A]	MET
1	C	85[B]	MET
1	C	105	PHE
1	C	129	GLU
1	C	164	SER
1	C	171	ASP
1	C	175	ASP
1	D	76	ARG
1	D	138	GLN
1	D	193	ARG
1	E	66	SER

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Mol	Chain	Res	Type
1	E	67	THR
1	E	82	ASP
1	E	89	SER
1	E	97	ASP
1	E	117	THR
1	E	140	ARG
1	E	144	GLN
1	E	162	ARG
1	E	203[A]	ARG
1	E	203[B]	ARG
1	F	56	CYS
1	F	76	ARG
1	F	94	ARG
1	F	103	ASN
1	F	131	LEU
1	F	154	LEU
1	F	161	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	103	ASN
1	A	179	GLN
1	A	186	GLN
1	A	187	GLN
1	B	186	GLN
1	B	187	GLN
1	C	95	GLN
1	C	103	ASN
1	C	179	GLN
1	E	103	ASN
1	E	107	GLN
1	F	95	GLN
1	F	181	HIS

5.3.3 RNA

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 11 ligands modelled in this entry, 1 is monoatomic - leaving 10 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	EDO	C	302[B]	-	3,3,3	0.68	0	2,2,2	0.05	0
5	FLC	C	303	-	12,12,12	0.97	0	17,17,17	1.61	3 (17%)
3	EDO	A	302	-	3,3,3	0.68	0	2,2,2	0.09	0
2	ACT	C	301	6	3,3,3	1.34	1 (33%)	3,3,3	0.51	0
2	ACT	B	302	-	3,3,3	1.16	0	3,3,3	0.61	0
2	ACT	A	301	-	3,3,3	1.40	1 (33%)	3,3,3	0.54	0
2	ACT	D	301	-	3,3,3	0.64	0	3,3,3	0.74	0
3	EDO	C	302[A]	-	3,3,3	0.52	0	2,2,2	0.40	0
5	FLC	D	302	-	12,12,12	1.00	0	17,17,17	1.65	3 (17%)
4	SER	B	301	-	4,5,6	0.66	0	0,5,7	-	-

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	EDO	C	302[B]	-	-	1/1/1/1	-
5	FLC	C	303	-	-	7/16/16/16	-
3	EDO	A	302	-	-	1/1/1/1	-
3	EDO	C	302[A]	-	-	1/1/1/1	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	FLC	D	302	-	-	3/16/16/16	-
4	SER	B	301	-	-	0/2/4/6	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	301	ACT	CH3-C	2.39	1.59	1.49
2	C	301	ACT	CH3-C	2.31	1.58	1.49

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	D	302	FLC	OB2-CBC-CB	4.55	120.95	113.05
5	C	303	FLC	OB2-CBC-CB	4.13	120.22	113.05
5	C	303	FLC	OG2-CGC-CG	2.29	121.71	114.35
5	D	302	FLC	OA2-CAC-OA1	-2.11	118.03	123.30
5	C	303	FLC	OA2-CAC-CA	2.10	121.09	114.35
5	D	302	FLC	OG2-CGC-CG	2.04	120.91	114.35

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	C	303	FLC	CAC-CA-CB-CBC
5	C	303	FLC	CAC-CA-CB-CG
5	C	303	FLC	CAC-CA-CB-OHB
5	D	302	FLC	CAC-CA-CB-CBC
5	D	302	FLC	CAC-CA-CB-OHB
5	D	302	FLC	CAC-CA-CB-CG
5	C	303	FLC	OHB-CB-CG-CGC
5	C	303	FLC	CA-CB-CG-CGC
3	A	302	EDO	O1-C1-C2-O2
3	C	302[B]	EDO	O1-C1-C2-O2
5	C	303	FLC	CG-CB-CBC-OB1
5	C	303	FLC	CG-CB-CBC-OB2
3	C	302[A]	EDO	O1-C1-C2-O2

There are no ring outliers.

7 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	302[B]	EDO	1	0
5	C	303	FLC	2	0
3	A	302	EDO	1	0
2	B	302	ACT	1	0
3	C	302[A]	EDO	1	0
5	D	302	FLC	2	0
4	B	301	SER	1	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å^2)	Q<0.9
1	A	144/175 (82%)	0.43	7 (4%) 29 36	27, 42, 77, 95	0
1	B	150/175 (85%)	0.26	1 (0%) 87 91	29, 49, 70, 83	0
1	C	144/175 (82%)	0.41	5 (3%) 44 51	25, 42, 71, 86	0
1	D	151/175 (86%)	0.42	4 (2%) 56 63	28, 46, 68, 79	0
1	E	149/175 (85%)	0.32	3 (2%) 65 71	36, 55, 73, 88	0
1	F	145/175 (82%)	1.06	26 (17%) 1 1	40, 69, 104, 111	0
All	All	883/1050 (84%)	0.48	46 (5%) 27 34	25, 50, 86, 111	0

All (46) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	F	131	LEU	7.1
1	F	114	ALA	7.0
1	A	199	THR	6.2
1	F	128	ILE	4.4
1	F	63	GLN	4.1
1	F	122	ARG	3.9
1	F	87	ALA	3.8
1	F	92	GLN	3.7
1	F	117	THR	3.6
1	F	199	THR	3.6
1	C	58	ASP	3.5
1	A	186	GLN	3.3
1	F	60	TRP	3.3
1	A	193	ARG	3.2
1	C	196	GLU	3.2
1	F	83	ARG	3.2
1	E	119	TYR	3.1
1	F	165	LYS	3.0
1	D	205	LEU	3.0

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Mol	Chain	Res	Type	RSRZ
1	F	115	LYS	3.0
1	F	101[A]	TRP	2.9
1	F	119	TYR	2.9
1	F	95	GLN	2.7
1	A	196	GLU	2.6
1	E	97	ASP	2.6
1	E	175	ASP	2.6
1	F	196	GLU	2.6
1	D	168	GLN	2.5
1	A	184	LEU	2.5
1	C	173	GLU	2.5
1	B	205	LEU	2.4
1	F	98	ASP	2.4
1	D	166	LEU	2.4
1	C	179	GLN	2.3
1	F	157	ALA	2.3
1	F	85	MET	2.3
1	F	198	LEU	2.2
1	F	123	GLN	2.2
1	F	124	LEU	2.2
1	C	177	LEU	2.2
1	A	189	GLU	2.2
1	F	116	ILE	2.1
1	A	167	GLN	2.1
1	F	158	GLU	2.0
1	D	185	GLN	2.0
1	F	127	ARG	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum,

median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
5	FLC	C	303	13/13	0.51	0.22	65,79,87,95	0
2	ACT	B	302	4/4	0.69	0.21	46,63,67,69	0
5	FLC	D	302	13/13	0.72	0.29	61,70,76,79	0
4	SER	B	301	6/7	0.79	0.18	70,72,79,80	0
2	ACT	A	301	4/4	0.81	0.19	43,45,53,58	0
2	ACT	D	301	4/4	0.83	0.15	35,56,57,64	0
2	ACT	C	301	4/4	0.86	0.23	43,46,50,54	0
3	EDO	A	302	4/4	0.90	0.22	33,40,40,55	0
3	EDO	C	302[B]	4/4	0.94	0.41	25,28,36,38	4
3	EDO	C	302[A]	4/4	0.94	0.41	33,35,36,38	4
6	MG	C	304	1/1	0.94	0.05	52,52,52,52	0

6.5 Other polymers (i)

There are no such residues in this entry.